

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
9 September 2005 (09.09.2005)

PCT

(10) International Publication Number
WO 2005/084090 A1

(51) International Patent Classification⁷: **H05K 1/16**, 3/46
(21) International Application Number:
PCT/US2005/006006

(22) International Filing Date: 23 February 2005 (23.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/546,998 23 February 2004 (23.02.2004) US

(71) Applicant (for all designated States except US): **GEORGIA TECH RESEARCH CORPORATION** [US/US];
505 10th Street, Atlanta, GA 30332-0415 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WHITE, George, E.** [US/US]; 2836 Saddlebrook Way, Marietta, GA 30064 (US). **SWAMINATHAN, Madhavan** [IN/US]; 1458 Grovehurst Drive, Marietta, GA 30062 (US). **SUNDARAM, Venkatesh** [IN/US]; 5362 Medlock Corners Drive, Norcross, GA 30092 (US). **DALMIA, Sidharth** [IN/US]; 115 N. Clublands Ct., Alpharetta, GA 30332 (US).

(74) Agents: **GRIFFIN, Malvern, U., III** et al.; Sutherland Asbill & Brennan LLP, 999 Peachtree Street, NE, Atlanta, GA 30309-3996 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

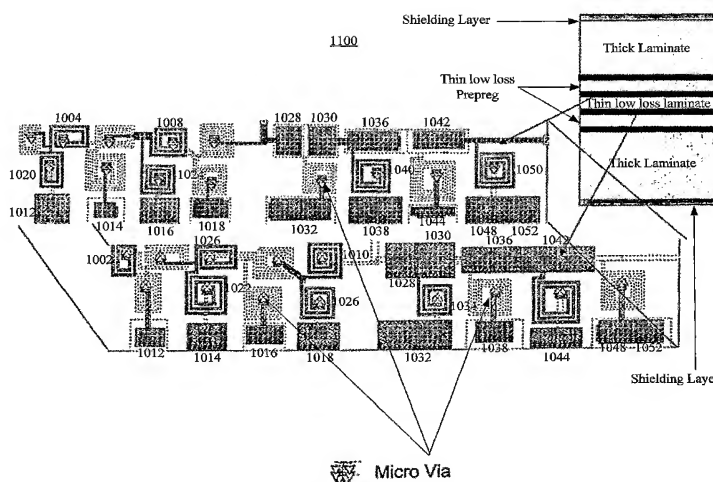
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: LIQUID CRYSTALLINE POLYMER- AND MULTILAYER POLYMER-BASED PASSIVE SIGNAL PROCESSING COMPONENTS FOR RF/WIRELESS MULTI-BAND APPLICATIONS



(57) Abstract: The present invention provides all organic fully-packaged miniature bandpass filters, baluns, diplexers, multiplexers, couplers and a combination of the above manufactured using liquid crystalline polymer (LCP) and other multilayer polymer based substrates. These devices are manufactured using one or more LCP layers having integrated passive components formed thereon to provide the density and performance necessary for multi-band wireless devices. In the designs involving multiple LCP layers, the LCP layers are separated by prepreg layers. In accordance with an aspect of the present invention, coplanar waveguide, hybrid stripline/coplanar waveguide and/or microstrip topologies are utilized to form the integrated passive components, and the devices can be mass produced on large area panels at least 18 inches by 12 inches with line widths smaller than 10µm.

WO 2005/084090 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.